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10/064,255	06/26/2002	Chien-Hsien Ho	ACMP0017USA	8438

27765 7590 03/28/2003

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EXAMINER

LIANG, LEONARD S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,255

Applicant(s)

HO, CHIEN-HSIEN

Examiner

Leonard S Liang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "110" has been used to designate both a printer and the gap in a light source (See figure 6). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

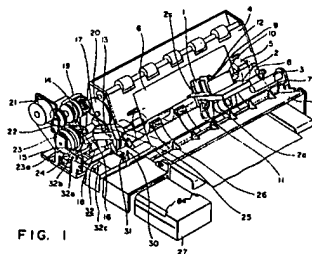
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiramatsu et al (US Pat 5168291).

Hiramatsu et al discloses:

- {claim 1} A printer comprising a housing, a track installed within the housing (figure 1);



a carriage moveably installed on the track (figure 1, reference 2); a print head (figure 1, reference 1); a position detecting mechanism comprising a first portion installed at a calibration position neighboring the track, and a second portion installed on the cartridge (figure 1, reference 11; figure 2, reference 11, 31c; figure 3-4; column 6, lines 39-68);

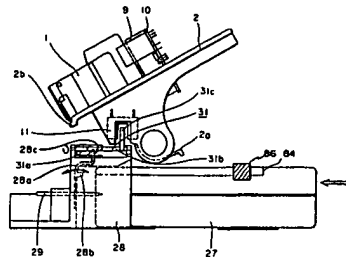


FIG. 2

control circuitry for controlling operations of the printer and recording the calibration position at the track, the control circuitry comprising a counter for recording a counted position of the second portion of the position detecting mechanism (abstract; column 10, lines 54-56); wherein the calibration position is within a range which the print head is capable of printing the medium, and the second position is capable of passing by the first portion when the print head simultaneously ejects ink onto the medium (column 5, lines 37-68)

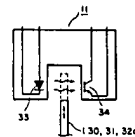


FIG. 3

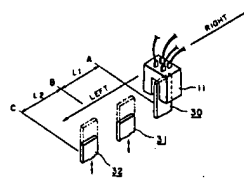


FIG. 4

- {claim 2} the second portion comprises a light source and a light sensor installed on the carriage, the first portion comprising a shield installed on the housing for shielding light transmitted from the light source to the light sensor (figure 1, reference 11; figure 2, reference 11, 31c; figure 3-4; column 5, lines 63-68)
- {claim 11} a step motor for driving the carriage wherein the counter counts rotational steps of the step motor to record the position of the second portion corresponding to the track (column 8, lines 1-6)

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al (US Pat 5168291) in view of Ito et al (US Pat 5245359).

Hiramatsu et al discloses:

- {claim 3} The printer (as taught in claim 2 above)
- {claim 4} The printer (as taught in claim 2 above)
- {claim 5} The printer (as taught in claim 1 above)
- {claim 8} The printer (as taught in claim 1 above)

Hiramatsu et al differs from the claimed invention in that it does not disclose:

- {claim 3} a first edge of the shield corresponds to the calibration position neighboring the track; and when the light source and the light sensor on the carriage move to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the light source and the light sensor corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions
- {claim 4} a second edge of the shield corresponds to the calibration position of the track; and when the light source and the light sensor on the carriage move to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the light source and the light sensor corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions

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- {claim 5} the first portion comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor
- {claim 6} the light source and the light sensor correspond to the calibration position of the track; and when a first edge of the shield moves to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the first edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions
- {claim 7} the light source and the light sensor correspond to the calibration position of the track; and when a second edge of the shield moves to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the second edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions
- {claim 8} when printing the medium, if a difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is within a first predetermined range, the control circuitry does not need to calibrate the position of the carriage

Ito et al discloses:

- {claim 3} a first edge of the shield corresponds to the calibration position neighboring the track; and when the light source and the light sensor on the carriage move to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the light source and the light sensor corresponding to the track

counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions (column 5, lines 1-10)

- {claim 4} a second edge of the shield corresponds to the calibration position of the track; and when the light source and the light sensor on the carriage move to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the light source and the light sensor corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions (column 5, lines 1-10)
- {claim 5} the first portion comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor (column 5, lines 1-10)
- {claim 6} the light source and the light sensor correspond to the calibration position of the track; and when a first edge of the shield moves to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the first edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions (column 5, lines 1-10)
- {claim 7} the light source and the light sensor correspond to the calibration position of the track; and when a second edge of the shield moves to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the second edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions (column 5, lines 1-10)
- {claim 8} when printing the medium, if a difference between the position of the second portion corresponding to the track recorded by the counter and the

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position of the calibration position at the track recorded by the control circuitry is within a first predetermined range, the control circuitry does not need to calibrate the position of the carriage (inherent in view of Ito et al; if there is little difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry, then the counter will not be stepwise increased and thus, there is no need to calibrate)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Ito et al into the invention of Hiramatsu et al. The motivation for the skilled artisan in doing so is to gain the benefit of detecting the position of the carriage (column 6, lines 9-10).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al (US Pat 5168291) in view of Ito et al (US Pat 5245359), as applied to claim 8 above, and further in view of Choo (US Pat 5825381).

Hiramatsu et al in view of Ito et al differs from the claimed invention in that it does not disclose that when printing the medium, if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is between the first predetermined range and a second predetermined range, the control circuitry will calibrate the position of the carriage.

Choo discloses, with respect to claim 9, that when printing the medium, if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is between the first predetermined range and a second predetermined range, the control circuitry will calibrate the position of the carriage (column 1, lines 17-23, 39-43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Choo into the invention of Hiramatsu et al in view of Ito et al so that when printing the medium, if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is between the first

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predetermined range and a second predetermined range, the control circuitry will calibrate the position of the carriage. The motivation for the skilled artisan in doing so is to gain the benefit of efficiently sensing a home position of a carriage supporting a removable print cartridge (column 2, lines 10-16).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al (US Pat 5168291) in view of Ito et al (US Pat 5245359), and Choo (US Pat 5825381), as applied to claim 9 above, and further in view of Bronswijk et al (US Pat 6419342).

Hiramatsu et al in view of Ito et al and Choo differs from the claimed invention in that it does not disclose that when printing the medium, if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is greater than the second predetermined range, the control circuitry will instantly stop printing the medium to calibrate the position of the carriage.

Bronswijk et al discloses, with respect to claim 10, calibrating a writing device to correct print deviations and stopping printing at an early stage (column 7, lines 3-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Bronswijk et al into the invention of Hiramatsu et al in view of Ito et al and Choo. The motivation for the skilled artisan in doing so is to gain the benefit of saving time and paper (column 7, lines 12-13). The combination naturally suggests that if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is greater than the second predetermined range, the control circuitry will instantly stop printing the medium to calibrate the position of the carriage. This is because at ranges greater than the second predetermined range, there is greater print deviation, which is the problem that Bronswijk is trying to address.

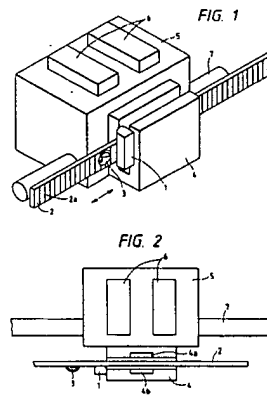
6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al (US Pat 5168291) in view of Watanabe (US Pat 6264303).

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Hiramatsu et al discloses, with respect to claim 12, The printer (as taught in claim 1 above); a DC motor for driving the carriage (column 8, lines 1-6).

Hiramatsu et al differs from the claimed invention in that it does not disclose an optical ruler installed on the housing; a light source installed on the carriage for emitting light toward the optical ruler; a light sensor for detecting the light emitted by the light source through the optical ruler and generating corresponding position signals; wherein the counter uses position signals generated by the light sensor to record the position of the second portion of the second portion corresponding to the track.

Watanabe discloses, with respect to claim 12, an optical ruler installed on the housing; a light source installed on the carriage for emitting light toward the optical ruler; a light sensor for detecting the light emitted by the light source through the optical ruler and generating corresponding position signals; wherein the counter uses position signals generated by the light sensor to record the position of the second portion of the second portion corresponding to the track (figure 1-2, reference 2; abstract).



It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Watanabe into the invention of Hiramatsu et al so that there is an optical ruler installed on the housing; a light source installed on the carriage for emitting light toward the optical ruler; a light sensor for detecting the light emitted by the light source through the optical ruler and generating corresponding position signals; wherein the counter uses position signals generated by the light sensor to record the position of the second portion of the second portion corresponding to the track. The motivation for the skilled artisan in doing so is to gain the benefit of optically detecting the position of a carriage via a linear scale.

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7. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al (US Pat 5168291) in view of Ito et al (US Pat 5245359) and Choo (US Pat 5825381).

Hiramatsu et al discloses:

- {claim 13} A printer comprising a housing; a track installed within the housing; a carriage movable installed on the track; a print head installed on the carriage for ejecting ink onto a medium; a position detecting mechanism comprising a first portion installed at a calibration position neighboring the track, and a second portion installed on the carriage, the calibration position being within a range the print head is capable of printing the medium, the second portion being capable of passing by the first portion when the print head simultaneously ejects ink onto the medium; and control circuitry for controlling operations of the printer and recording the calibration position, the control circuitry having a counter for recording a counted position of the second portion of the position detecting mechanism (as taught in claim 1)
- {claim 14} the second portion comprises a light source and a light sensor installed on the carriage, the first portion comprising a shield installed on the housing for shielding light transmitted from the light source to the light sensor (as taught in claim 2)

Hiramatsu et al differs from the claimed invention in that it does not disclose:

- {claim 13} when a difference between the counted position of the second portion and the calibration position recorded in the control circuitry is larger than a predetermined threshold, the control circuitry calibrates the position of the carriage
- {claim 15} the first position comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor

Ito et al discloses:

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- {claim 13} when a difference between the counted position of the second portion and the calibration position recorded in the control circuitry is larger than a predetermined threshold, the home position is sensed (column 5, lines 1-10)
- {claim 15} the first position comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor (as taught in claim 5)

Choo discloses, with respect to claim 13, calibrating the carriage position (column 1, lines 17-23, 39-43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Ito et al into the invention of Hiramatsu et al so that when a difference between the counted position of the second portion and the calibration position recorded in the control circuitry is larger than a predetermined threshold, the home position is sensed. The motivation for the skilled artisan in doing so is to gain the benefit of detecting the position of the carriage (column 6, lines 9-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Choo into the invention of Hiramatsu et al in view of Ito et al so that the carriage position is calibrated. The motivation for the skilled artisan in doing so is to gain the benefit of efficiently sensing a home position of a carriage supporting a removable print cartridge (column 2, lines 10-16).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ha (US Pat 6015204) discloses a method for sensing carriage position separation and compensating carriage position of an inkjet printer.

Ito et al (US Pat 5075609) discloses a recording apparatus.

Subirada et al (US Pat 6164750) discloses an automated test pattern technique using accelerated sequence of color printing and optical scanning.

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Gompertz (US Pat 6378977) discloses a system and method for conveying printer status information.

Hoskins et al (US Pat 4167013) discloses circuitry for perfecting ink drop printing at nonlinear carrier velocity.

Mizoguchi (US Pat 4926196) discloses an ink jet printer.

Elgee (US Pat 6499827) discloses an apparatus and method of compensating for print engine and encoder expansion or contraction in a printing device.

Beauchamp (US Pat 5825378) discloses the calibration of media advancement to avoid banding in a swath printer.

Simons (US Pat 6010206) discloses a method and system for detecting the position of a carriage.

Tung et al (US Pat 6435641) discloses a media movement apparatus.

Tazaki (US Pat 4580150) discloses a recording apparatus.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

lsl

March 21, 2003


John Barlow
Supervisory Patent Examiner
Technology Center 2800